

CLAIMS

1. A method for estimating input power in a cable modem device having a tuner and a modem, the modem having a receiver with an automatic gain control (AGC) circuit, the method comprising the steps of:

inputting a plurality of calibration signals having known input frequencies and known input power levels into the receiver;

recording a calibration point corresponding to each of said plurality of signals in a calibration matrix;

connecting the calibration points in said calibration matrix to generate look-up table values stored in a look-up table; and

storing the look-up table in the modem, wherein said look-up table values are used to compute input power to the receiver.

2. The method of claim 1, wherein the calibration point in the recording step is an accumulated value of an integrator in the AGC circuit.

3. The method of claim 2, wherein the look-up table values are a plurality of accumulated values of an integrator in the AGC circuit, each of said plurality of accumulated values corresponding with a single frequency and a single amplitude.

4. The method of claim 1, wherein the recording step records at least one selected from the group consisting of the input frequency of the calibration signal, the

input power of the calibration signal, and an accumulated value of an integrator in the AGC circuit as the calibration point.

5. The method of claim 1, wherein the connecting step includes interpolating between the calibration points.

6. The method of claim 5, wherein the interpolating step is conducted using a first order equation.

7. The method of claim 5, wherein the interpolating step is conducted using a second order equation.

8. The method of claim 5, wherein the interpolating step is conducted using an audio tone.

9. The method of claim 5, wherein the interpolating step is conducted using a known voltage variable amplifier curve.

10. The method of claim 1, wherein the connecting step includes the step of interpolating between the calibration points, and wherein the method further comprises the step of extrapolating beyond the range of the calibration points.

11. The method of claim 10, wherein the extrapolation step is conducted using linear projection from a localized amplitude corresponding to a selected calibration frequency.

12. The method of claim 11, wherein the extrapolation step is repeated for each calibration frequency.

13. The method of claim 1, wherein the storing step stores the look-up table as 8-bit data.

14. The method of claim 13, wherein the storing step also stores a maximum value and a minimum value for the frequency and the amplitude, wherein said maximum and minimum values are used to scale the 8-bit data.

15. A method for estimating input power in a cable modem device having a tuner and a modem, the modem having a receiver with an automatic gain control (AGC) circuit, the method comprising the steps of:

inputting a plurality of calibration signals having known input frequencies and known input power levels into the receiver;

recording an accumulated value in an integrator in the AGC corresponding to each of said plurality of calibration signals as a calibration point in a calibration matrix;

interpolating between the calibration points and extrapolating from the calibration points in said calibration matrix to generate look-up table values stored in a look-up table; and

storing the look-up table in the modem, wherein said look-up table values are
5 used to compute input power to the receiver.

16. The method of claim 15, wherein the interpolation step is conducted using a first order algorithm.

10 17. The method of claim 16, wherein the interpolation step is conducted using a second order algorithm.

18. The method of claim 15, wherein the interpolating step is conducted using an audio tone.

15 19. The method of claim 15, wherein the interpolating step is conducted using a known voltage variable amplifier curve.

20. The method of claim 15, wherein the look-up table values are stored as 8-bit data.
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21. The method of claim 15, wherein the storing step also stores a maximum value and a minimum value for the frequency and the amplitude, wherein said maximum and minimum values are used to scale the 8-bit data.

5 22. A cable modem device, comprising:
a tuner that tunes to an input signal;
a modem coupled to the tuner, the modem having a receiver with an automatic gain control (AGC) circuit and a memory; and
a look-up table stored in the memory, the look-up table containing a plurality of
10 look-up table values generated by inputting a plurality of calibration signals having known input frequencies and known input power levels into the receiver; recording an accumulated value in an integrator in the AGC corresponding to each of said plurality of calibration signals as a calibration point in a calibration matrix, and interpolating between the calibration points and extrapolating from the calibration points in said calibration
15 matrix to generate the look-up table values,
wherein said look-up table values are used to compute input power to the receiver.

23. The cable modem device of claim 22, wherein the look-up table values are stored in the memory as 8-bit data.

24. The cable modem device of claim 23, wherein the memory also contains a maximum value and a minimum value for the frequency and the amplitude, wherein said maximum and minimum values are used to scale the 8-bit data.

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